EARTH SCIENCES
D I V I S I O N

Enhancing Energy Resources

In keeping with the need for energy that is affordable, dependable, and protective of the environment, ESD scientists are working with the geothermal, oil, and gas industries to develop innovative methods to increase production from subsurface energy resources.

Understanding Climate Change

ESD scientists conduct research to build the foundation for climate change prediction, impact assessment, and mitigation (including modeling, testing, and insuring the efficacy and safety of geologic CO_2 sequestration). We also discover insights into the biogeochemical cycles (terrestrial, oceanic, and atmospheric) that are critical to stewardship of water and energy resources.

The Earth Sciences Division (ESD) brings together hydrogeologists, geochemists, geophysicists, computer scientists, microbiologists, and engineers to provide innovative earth-science solutions to energy and environmental problems. ESD blends fundamental and applied research to tackle the key national and international problems related to:

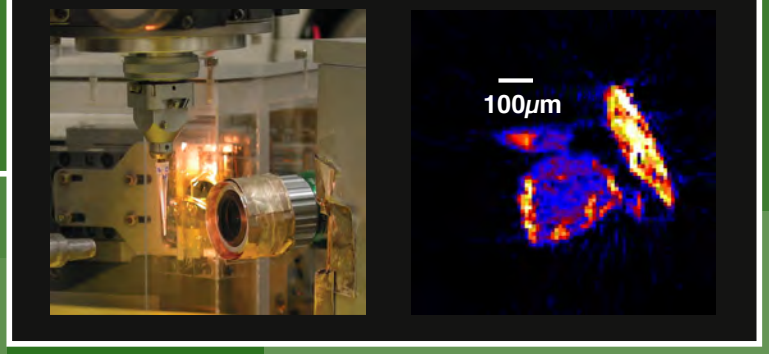
- Improved oil recovery
- Energy resources
- Climate change
- CO_2 sequestration
- Environmental remediation
- Nuclear waste disposal

Improving the Environment

ESD scientists conduct advanced multidisciplinary research—using theoretical, numerical, and experimental approaches that range from the molecular to the field scale—to provide the scientific foundation needed for environmental remediation and water resources management.

Safely Disposing of Nuclear Waste

Deep underground in the Exploratory Studies Facility at Yucca Mountain, Nevada, ESD scientists are developing strategies for resolving nuclear waste disposal issues confronting the national and international community. We are the world leader in characterizing and modeling both unsaturated zone fluid flow and transport, and thermally and chemically driven coupled processes. In addition, ESD collaborates with the International Atomic Energy Agency as a way of maintaining communication and sharing information among countries involved in nuclear waste management and disposal.



Exploring Earth Processes

Through a program of fundamental research, ESD scientists have developed the ability to investigate the earth's complex coupled processes, ranging from the nanometer to kilometer scale, thereby gaining a better understanding of the important interactions that shape and control the planet. In this cutting-edge work, ESD scientists have access to, and take advantage of, the major, internationally known facilities at Berkeley Lab, such as the Advanced Light Source (ALS), the National Center for Electron Microscopy (NCEM), the National Energy Research Scientific Computing Center (NERSC), and the Molecular Foundry.

Berkeley Lab

http://www-esd.lbl.gov/